

Agriculture Yesterday, Today, and Tomorrow
Evaluation of Agriculture Extension in the Province of Nampula, Mozambique

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This paper examines Mozambique's pluralistic national system of rural extension. The Government's present agricultural policy framework has resulted in the development of a National Extension Master Plan that calls for the advancement of an Integrated National Extension System (SISNE). SISNE is an institutionally diversified system of extension, utilizing both public sector and private sector extension providers to disseminate agricultural information to farmers. Aside from setting the stage for discussion, this paper has two purposes. The first is to examine describe the history and current extension system in Mozambique. The second is to examine the problems and challenges that confront Mozambique's extension model. The paper concludes with a consideration of the meaning of Mozambique's move towards a pluralistic national rural extension system both for its own purposes and the development of similar purposes in other developing countries.

Theoretical Framework: Extension Typology, Use, and Effectiveness in Sub Saharan Africa

The theoretical framework for this paper is based on a summary of agricultural extension models in Sub-Saharan Africa covered by Davis (2008) and a typology developed by NAFES (2005). Agricultural extension can be defined as "the entire set of organizations that support and facilitate people engaged in agricultural production to solve problems and to obtain information, skills, and technologies to improve their livelihoods and well-being" (Davis, 2008, p. 1). There may be multiple actors that may be involved at different scales including governmental extension agencies, non-governmental organizations (NGOs), producer organizations, cooperatives, and associations, private sector actors including purchasers of agricultural products, and training organizations (Neuchâtel Group, 1999; Davis, 2008).

Davis (2008) divided extension into "three broad categories: diffusion or government-driven; participatory or demand-driven; and private or supply driven, with the different systems or models falling under these three overall types" (p. 4). Many extension systems in Saharan Africa today are combinations of these broad categories. I develop a typology based on work from NAFES (2005) to categorize the different models that have been used in Sub Saharan Africa.

Typology of Extension- How communication takes place in an extension system: Paternalism versus Participation

In this paper I use a typology of extension based on the type of extension (Paternalism versus Participation) and Type of Communication (persuasion versus education) (NAFES, 2005). Early extension describes a model of communication that involved the transmission of messages from 'senders' to 'receivers'. Senders are usually people in authority, such as government planners, researchers, and extension staff, while receivers are usually farmers who are relatively poor and uneducated (see Table 1).

The communication is between researchers (senders) and farmers (receivers). Extension programs based on this model has been described as 'paternalistic'; in other words, the actors in the communication process have a parent/child or teacher/student relationship. Other authors have used the term 'top-down' to describe these programs (NAFES, 2005).

An alternative to the paternalistic extension are more participatory approaches, in which the “knowledge and opinions of farmers is considered to be just as important as that of researchers or government officials” (p. 5; NAFES, 2005). Information-sharing and joint decision-making are hallmarks of participatory approaches often referred to as ‘bottom-up’.

The communication in the participatory is based on a *knowledge system* consisting of many actors who play different roles at different times. The communication involves a *negotiation* rather than a transmission, with actors collaborating in the construction of shared meanings rather than simply exchanging information (NAFES, 2005).

The second part of the model examines the type of communication including persuasion versus education. Although extension programs have many different goals, most programs fall into one of two basic categories: “systems of communication that aim to change the *behavior* of rural people; and systems of communication that aim to change the *knowledge* of rural people” (p 7; NAFES, 2005; (see Table 1).

Change is often enacted as alteration in knowledge and leads to a transformation in behavior. But the difference between these two categories is found in the answer to a fundamental question: *who decides?* If the answer to these questions is ‘government policy-makers’ or ‘project managers’ or ‘researchers’, then the purpose of extension is to change behavior. This approach to extension has been variously described as ‘directive extension’, ‘social marketing’ and ‘propaganda’.

If the answer is ‘farmers’ or ‘rural people’ or ‘local men and women’, then the purpose of extension is changing knowledge. This knowledge helps rural people make *their own* decisions regarding farming practices. This approach to extension is closely related to ‘non-formal education’.

Any particular extension system can be described both in terms of both *how* communication takes place and *why* it takes place. It is not the case that paternalistic systems are always persuasive, nor is it the case that participatory projects are necessarily educational. Instead there are four possible combinations, each of which represents a different extension paradigm including Technology Transfer (persuasive+paternalistic), Advisory Work (persuasive+participatory), Human Resource Development (educational+paternalistic), and Facilitation for Empowerment (educational+participatory; see Table 1).

1. **Technology Transfer** (persuasive+paternalistic). This paradigm was prevalent in colonial times, and reappeared in the 1970s and 1980s when the Training and Visit system was established across Asia. Technology transfer involves a top-down approach that delivers specific recommendations to farmers about the practices they should adopt (see Table 1; Davis, 2008; NAFES, 2005).

Table two summarizes the strengths and weaknesses of the model. Many authors such as Gautam (2000), Bindlish and Evenson (1997), and Davis (2008) found positive including increased production. Other such as Dejene (1989), Tchouama and Steele (1997), and Asiabaka & Bamisile (1992) reported problems and barriers to the use of the model. Table three reviews the countries in which the model has been used which include Ghana and Mali.

Another model that fall into this paradigm is *Agricultural Technology Management Agency Model (ATMA)* (Singh, Swanson, & Singh, 2006). ATMA links research and extension using bottom-up planning procedures. Anderson (2007) includes four axioms “(a) Don’t encourage farmers to produce without a market; (b) Use products that are easily transported; (c) Pay attention to agroecological conditions for crops; and (d) Diversify crops to avoid saturation” Davis, 2008) (see Table 1; NAFES, 2005).

The third model is *Demonstration and Training Extension System (PADETES)* uses demonstration plots and links technologies to inputs through a package deal (SG, 2000; Davis, 2008) (see Table 1; Davis, 2008; NAFES, 2005). Many farmers abandoned technologies promoted in this model (Bekele, Anandajayasekeram, & Kisamba-Mugerwa, 2006) and extension agents felt they were sales people (see Table 3). Other researchers found that agricultural extension contributed to increased agricultural productivity (Ayele, Alemu, & Kelemework, 2005; Davis, 2008).

A fourth model is the *National Agricultural Advisory Services (NAADS)* which includes decentralization, outsourcing, market orientated, and has cost-recovery (Anderson, 2007). In this system farmers may fire the extension agent if they are not pleased with the service (see Table 1; Davis, 2008; NAFES, 2005). Benin, et al. (2005) showed positive farm income and services, while Anderson (2007) shows strong knowledge but little productivity and income gains (see Table 3; Davis, 2008).

2. **Advisory work** (persuasive+participatory). This paradigm can be seen today where government organizations or private consulting companies respond to farmers enquiries with technical prescriptions. It also takes the form of projects managed by donor agencies and NGOs that use participatory approaches to promote pre-determined packages of technology (see Table 1). An example is *Fee-for-service* extension is provided for by the public (or another sector) and paid for by the farmers (Anderson & Feder, 2005; Davis, 2005). Small groups of farmers usually contract the services (see Table 1; Davis, 2008; NAFES, 2005).

3. **Human Resource Development** (educational+paternalistic). This paradigm dominated the earliest days of extension in Europe and North America, when universities gave training to rural people who were too poor to attend full-time courses. It continues today in the outreach activities of colleges around the world. Top-down teaching methods are employed, but students are expected to make their own decisions about how to use the knowledge they acquire (see Table 1; NAFES, 2005).

4. **Facilitation for empowerment** (educational+participatory). This paradigm involves methods such as experiential learning and farmer-to-farmer exchanges. Knowledge is gained through interactive processes and the participants are encouraged to make their own decisions (see Table 1; Davis, 2008; NAFES, 2005).

One example are *Farmer field schools (FFS)* which is a participatory method of learning, technology development, and dissemination based on adult-learning principles such as

experiential learning. Davis (2008) wrote, “Groups of 20-25 farmers typically meet weekly in an informal setting in their own environment with a facilitator. The defining characteristics of FFS include discovery learning, farmer experimentation, and group action” (p. 9).

Table 1. Four paradigms of Agricultural Extension

Type of Extension/ Why communication takes place	Paternalistic	Participatory
Educational	Human Resource Development	Facilitation for Empowerment Farmer Field Schools Farmer Study Circles Information and Communications Technology
Persuasive	Technology Transfer Travel and Visit Agricultural Technology Management Agency (ATMA) Model Participatory Demonstration and Training Extension National Agricultural Advisory Services	Advisory work Fee-for-service

Van den Berg and Jiggins (2007) concluded that there was substantial immediate and developmental impact with the farmer field schools. The authors also reviewed studies with “limited or no effect on economic performance” (Davis, 2008; see Table 2). Farmer Field Schools have been used extensively in Ghana, Kenya, Malawi, Mali, Mozambique, Nigeria, Rwanda, Senegal, Tanzania, Uganda, and Zambia (see Table 3).

Another two models in this paradigm are *Farmer study circles* and *Information and Communications Technology*. The *Farmer Study Circles* are a more informal with no external “expert”. These meetings create an atmosphere in which people learn and solve their own problems (Davis, 2008). The *Information and Communications Technology* sector use technology such as mobile phone to provide cheap messages about crop price information via text messaging (Davis, 2008). This information is collected and shared amongst farmers.

Based on the current status of extension in Sub-Saharan Africa, it appears that pluralism is the future of extension in Sub-Saharan Africa, with a greater emphasis on demand-driven, participatory programs. Extension will have a greater focus on facilitation and access to markets through farmer group formation and ICTs. See Table 4 for various approaches and where they may work the best.

Table 2.

Modified Typology of Extension with a summary of Research Finding

Training and visit (T&V)	Gautam (2000) “increased geographical coverage, and improved linkages with research, overall the system was inefficient, ineffective, and not financially sustainable” Davis, 2008.	Bindlish and Evenson (1997) “made extension more effective, led to agricultural growth, and realized high rates of return” Davis, 2008.	Dejene (1989) “did not work as expected, and up to 25% of contact farmers did not have the necessary knowledge and skills” Davis, 2008.	Tchouama and Steele (1997) “found that only 30% of respondents had contact with the extension agent, and furthermore had difficulty applying the recommendations” Davis, 2008.	Extension agents lacked communication skills, transportation, and faced cultural barriers (Asiabaka & Bamisile, 1992).	T&V was seen as somewhat satisfactory in Kenya and Somalia (Davis, 2008).	“In Zimbabwe, a national extension and research project (not T&V) to improve productivity in rural areas via improved incentives for extension staff was as viewed as satisfactory” Davis, 2008.
Integrated agricultural development program	Davis(2008) wrote, “IRDPs’ weaknesses were that they were supply driven, inflexible, disregarded many institutions (including NGOs), were multi-sectoral but not holistic, disregarded cost recovery or privatization, had an enclave mentality, and had limited sustainability (Anderson, 2002).”						
Farmer field schools (FFS)	“Farmer field schools have shown remarkable impact in terms of pesticide reduction, increases in productivity, knowledge gain among farmers, and empowerment. However, these effects have been generally confined to the most directly-engaged farmers, rather than demonstrating adequate capacity for scaling up for greater impact. The FFS themselves are undergoing reforms to address these issues, such as becoming self-financed (Khisa, 2007)” (Davis, 2008).			“However, some studies do show that FFS has limited or no effect on economic performance, the environment and human health, and farmer-to-farmer dissemination of information and technologies. For a review of impact evaluations of FFS, please see van den Berg and Jiggins (2007), who conclude that there was substantial immediate and developmental impact for participation in FFS” (Davis, 2008).			

(Based on Davis, 2008)

Table 3

Extension Models in Selected SSA Countries Country Current Model(s), and Findings on Model Results (Based on Davis, 2008)

Angola	Rural Development and Extension Programme; FFS	
Benin	Participatory management approach; decentralized model; FFS	
Burkina Faso	FFS	
Cameroon	National Agricultural Extension and Research Program Support Project, FFS	
Ethiopia	Model based on SG-2000 approach: Participatory Demonstration and Training Extension System; FFS	‘Ethiopia’s Participatory Demonstration and Training Extension System (PADETES) use demonstration plots and links technologies to inputs through a package deal. Although 55% of respondents used the package, a good number of farmers later abandoned package components such as fertilizer or improved seed (Bekele, Anandajayasekeram, & Kisamba-Mugerwa, 2006). Extension workers saw their role mostly as distributors of fertilizer and credit rather than technical advisors. Other researchers found that agricultural extension, as well as other rural services, contributed significantly to agricultural productivity in Ethiopia (Ayele, Alemu, & Kelemework, 2005)’ (Davis, 2008).
Ghana	Unified Extension System (modified T&V); pluralistic with NGOs and private companies part of the national extension system; decentralized; FFS	
Kenya	Pluralistic system including public, private, NGOs; FFS; stakeholder approach (NALEP): sector-wide, focal area, demand-driven, group based approach	“The first phase ran five years, and was evaluated in 2006 (Cueller, Hedland, Mbai, & Mwangi, 2006). Data were collected from project documents and interviews with farmers. The analysis shows that 80% of respondents said that the program offered new opportunities, and 70% said that they viewed farming as a business as a result of NALEP. Regarding sustainability, 70% of respondents claimed that NALEP assisted them to gain profits from their farms” (Davis, 2008).
Malawi	Pluralistic, demand-driven, decentralized; “one village one product;” FFS	
Mali	Modified T&V; both private and parastatal services for cotton; FFS; SG-2000	
Mozambique	Government-led pluralistic extension; FFS	“Extension in Mozambique mainly focuses on introducing new varieties, promoting natural pesticides, and promoting commercialization. The study showed that access to extension increased farm production by 8.4%. Because only 13% of the rural population lived in villages with extension offices, one policy implication was the need to significantly extend coverage (and quality) of extension (ECON Analysis, 2005)” (Davis, 2008).
Nigeria	FFS; participatory; SG-2000	
Rwanda	Participative, pluralistic, specialized, bottom-up approach; FFS	
Senegal	FFS; government-led demand-driven and pluralistic system; FFS	
Tanzania	FFS; group-based approach; SG-2000; modified FSRE from Sokoine University of Agriculture’s Centre for Sustainable Rural Development; private extension; decentralized Participatory District Extension; pluralism	
Uganda	Pluralistic; National Agricultural Advisory Services (NAADS) is demand-driven, client-oriented, and farmer-led; SG-2000; FFS	“Benin, Nkonya, Okecho, Pender, Nahdy, Mugarura, et al. (2005) showed that NAADS had positive impacts on farm income and availability and quality of services. However, there was no significant difference in yield growth between NAADS and non-NAADS areas for most crops. At the same time, farmers in the NAADS areas did show less decline in income than in other areas due to adverse climactic conditions during that time. Shortage and timeliness of inputs were other problems in NAADS. A forthcoming piece on NAADS shows that there is a strong knowledge effect but that it does not translate into measurable productivity and income effects (reviewed in Anderson, 2007)” (Davis, 2008).
Zambia	Participatory Extension Approach; FFS	

Table 4
Extension Approaches and Potentials for Success

Approach	Where does it work?
Fee-for-service	High potential areas; capable public, private, and civil society providers
Travel and Visit	Homogeneous areas; hierarchal and structured systems
National Agricultural Advisory Services	Available markets and market infrastructure; capable public, private, and civil capital
Farmer Field Schools	High social capital; capable extension agents
Agricultural Technology Management Agency	Available markets; capable research, extension, and other technical backstoppers; decentralized system; strong links between line departments
Participatory Demonstration and Training Extension	Hierarchal and structured systems
Information and Communications Technology	ICT infrastructure; enabling policy environment (e.g. low taxes on mobile phone usage)
Agriculture and Livestock Extension Programme	High social capital; available markets and market infrastructure

This theoretical framework provides a summary of the primary extension models that are being used in Sub-Saharan Africa. It provides a framework by which the current extension system in Mozambique may be evaluated.

Research Site

The research site is Nampula Province, situated south of Cabo Delgado and borders Niassa to the west and Zambezia to the south. Its long coastal area includes the port of Nacala, the terminus of the railway which extends east to Malawi. Nampula is traditionally one of the most important agricultural production areas, with fertile land in the inland districts. The soils in the coastal districts of Memba, Angoche and Moma are poor. Cotton is an important cash crop, and is mostly grown in the district of Monapo. Cassava is the main staple food, followed by sorghum and maize. Large areas are also planted to beans and groundnuts.

The climate in Northern Mozambique features a hot and humid rainy season from December to March and a cooler dry season from April to November. The average annual temperature ranges

between 20 °C and 26° C. The climate is semi-arid, with an average annual rainfall of approximately 1,200mm.

Agriculture is the major economic activity in Northern Mozambique and is complemented by small animal husbandry (mainly poultry). Agriculture is conducted by smallholder farmers and is largely subsistence oriented. The area cultivated is directly related to the availability of family labor. Crop surpluses are sold to obtain other basic goods and inputs. By and large, the farming system is one of manual agriculture with few or no inputs used.

Goals and Methods

The goals are to 1) describe the history and current extension system in Mozambique and 2) the problems and challenges that confront Mozambique's extension model.

Methodologically, the guide for interview was based on Bernard's ideas for semi-structured interviews (Bernard 1995) and Kvale's writings on dynamic, positive interaction (Kvale 2004). Semistructured interviews are based on tight-rope walking between on one hand openness to the informant's associations from the questions – the informant can, through his answers, influence the directions of the interview. On the other hand, the interviewer has to ensure during the interview that the overall objectives and focuses of the interview guide are covered. Positive and dynamic interaction, according to Kvale, is about translating the research questions into everyday questions in order to promote the informants' motivations to tell about the topics behind the research questions instead of the just answering them shortly.

Interviews were with 22 representatives from government extension and NGO's regarding the current extension model, relations between institutions, challenges for each of the institutions, as well as the impact of current extension activities. These interviews were conducted in Nampula, Moma, Angoche, and Meconta

Each interview was followed by an evaluation, e.g. considering the questions: 1) Which new information (concepts, reasoning etc.) did the interview provide? 2) Does any of this new information open new perspectives in the answering of the overall research question? 3) How can this new information be tested/broadened in later interviews? and 4) How does the new information fit into information from previous interviews?

Qualitative research does not aim at being representative in a statistical sense (Kvale 2004; Wadel 1991; Spradley 1980). This does, however, not mean that any combination of informants would make a good sample to explore from. These initial interviews were then followed by further interviews with key informants as to the overall desire or strategy of the user groups.

The first step was to transcribe the interview. I then explored the data in order to become familiar with the interview information. From this initial review of the transcript, I began to see themes emerging from the data. Notations were made to record ideas that the action researcher identified while reading the data. I revisited with the major research questions as the lens for analysis. I then created a scheme that best defined the themes that have been identified and provided a way to break up the data for further analysis. The codes were then used to identify the specific sections of the interview data that represented the category.

The transcript was re-read with these codes in mind and sections of the data were bracketed and coded. To ensure reliability of the coding scheme, another person assisted in reviewing the transcript and used the coding scheme to code the data. Results were then shared and any discrepancies were discussed and resolved. Changes in the coding scheme included additions, deletions, and clarifications. Once the data was coded the data was then divided into themes. The data was then reviewed within the themes or categories, and an understanding of each theme was reached. Quotes were selected that best illustrate the meaning of the category; this provides a "voice" to people interviewed when describing the data.

Despite the many positive aspects of qualitative research, the limitation of the study is generalizability. The word 'generalizability' is defined as the degree to which the findings can be generalized from the study sample to the entire population (Polit & Hungler, 1991, p. 645). I suggest that while qualitative studies are not generalizable in the traditional sense of the word, nor do they claim to be, that they have other redeeming feature which makes them highly valuable in the education community. Partial generalizations may be possible to similar populations, but I feel that even this should not be a primary concern of qualitative research.

According to Adelman, Jenkins, and Kemmis (1980), the knowledge generated by qualitative research is significant in its own right. The authors argue that, while the aggregation of single studies allows theory building through tentative hypotheses culled from single findings, the generalizations produced are no less legitimate when about a single finding. I caution researchers to bear in mind the goals of the study when evaluating the quality of research reports. Problems related to sampling and generalizations may have little relevance to the goals of the study and the reality of the situation. In many situations, a small sample size may be more useful in examining a situation in dept from various perspectives, whereas a large sample would be inconsequential. The goal of a study may be to focuses on a selected contemporary phenomenon such as child abuse or addiction where in-depth descriptions would be an essential component of the process. In such situations, small qualitative studies can gain a more personal understanding of the phenomenon and the results can potentially contribute valuable knowledge to the community.

Stake (1980) counters the claim that single qualitative studies are not an adequate basis for generalizations. He is speaking specifically about case studies and makes the claim that they can be a preferred research method, especially in fields such as education and social work. Few laws have been validated in those fields, and Stake recommends that inquiry be directed toward gathering information that has practical and functional uses rather than the cultivation of persistent pedantic laws (Stake, 1980, p. 70). He further suggests that such methods may be in conceptual harmony with the professional reader's experience and thus be a natural basis for generalization (p. 64).

In addition to concerns about generalizability, qualitative methodology is rebuked because studies are often difficult to replicate. Future researchers may not have access to the same subjects, and if other subjects are used, results may differ. Subjects (respondents) may openly communicate with one researcher and remain distant with others. The aim, then, is on producing research that can inform and enhance reader's understandings.

Stake (1980) believes the most effective means of adding to understanding is by preparing research reports that speak to the reader through words and illustrations. Reports should be prepared in such a way as to resemble natural experiences attained in ordinary personal

involvement. He further claims that objective and scientific studies do an inadequate job of acquainting man (he is speaking of humankind) with himself and argues that research methods needs to capitalize upon the natural abilities of people powers to experience and understand.

Yin (1994) is concerned with rigor in non-experimental research, and while he concludes that studies do not require a minimum number of cases, or randomly select cases, he cautions researchers to work with the situation that presents itself in each case in structuring the best possible study that can be adequately described in the research report. Qualitative study lends itself well to this task.

A major strength of the qualitative approach is the depth to which explorations are conducted and descriptions are written, usually resulting in sufficient details for the reader to grasp the idiosyncracies of the situation.

Results

Objective number one is to describe the extension system in Mozambique. Agricultural extension in Mozambique started has passed through many stages including Travel & Visit and later the use of a pluralistic model. It may categorize as the technology transfer similar to that described by *National Agricultural Advisory Services* (NAADS) including decentralization and outsourcing (Anderson, 2007).

Mozambique's public sector rural extension service was founded in 1987, its initial development took place between 1989 and 1992 (Amisse, 1997; Gemo, 2000). The state farms basically provided field technicians in cash crops such as cotton, cashew and tobacco. Governmental Organizations as well as the majority of international Non Government Organization were involved at that time in emergency activities relating to drought and civil war. These emergency activities had more to do with the free distribution to displaced rural people of basic agriculture inputs (e.g. seeds and hand tools) than with extension activities.

International NGOs and United Nations agencies contributed significantly to the growth of public extension during this initial phase of extension's development. This included substantial the Danish international NGO and German Society for Technical Cooperation (GTZ, a government organization) provided technical assistance and some institutional support. FAO, UNICEF, UNDP, contributed technical and financial support. The International Fund for Agricultural Development (IFAD) also played a significant role as one of the first (and still current) funders of public sector extension.

Mozambique adopted training and visit (T&V) extension model with the support of the World Bank in 1992-1993. During this first phase there was prolonged drought and high insecurity because of the civil war. There was a hasty exodus of rural families seeking relatively safe zones. Extension was limited near to the provincial capitals. Normal extension did not take place until after the civil war in 1992.

The Government of Mozambique initiated a pluralistic plan with the National Agricultural Development Program (PROAGRI) in 1998. This plan undertook two major tasks: the operation

of a number of public sector extension networks throughout the country and the management of private sector providers, especially in areas where there are no public extension networks¹.

In the period from 1999–2003, Mozambique advanced an Integrated National Extension System (SISNE) including outsourcing, cost sharing with private and community extension structures and cost-recovery initiatives with individual farmers and farmer groups and associations. Outsourcing was the principal avenue selected for involving private sector providers, some of whom are already operating extension systems parallel to those of the public sector. One of the objectives of this outsourcing initiative was to prepare National Directorate of Rural Extension to coordinate, oversee and regulate private sector providers and to learn from the experience of outsourcing.

The PROAGRI II (2006-2010) strategy document further elaborated an agricultural sector strategy for Mozambique, which involved not only a wide variety of actors from the commercial sector, small-scale farmers, civil society and the public sector, but also various ministries in the public sector. The main objectives of PROAGRI II was: “(a) to build on the institutional strengthening achievements of PROAGRI I and complete the reform of the Ministry of Agriculture and the transformation of its operating modalities; (b) to improve the capacity at Province and District level for agricultural planning and program implementation in connection with the interventions supporting District decentralization; (c) to encourage and foster the evolution of farmer groups and associations and their partnerships with appropriate public, private and NGO sector agencies as service providers and/or enterprise partners; and (d) to translate these improvements as effectively as possible into direct, tangible and meaningful benefits and impact, the highest priority being given to accelerating the implementation of directly productive interventions at the small and medium farm and household level” (PROGRARI II, 2006).

PROGRARI I never decentralized, had community participation and/ or intersectoral coordination. The PROAGRI II strategy aimed to correct these flaws with its emphasis on the role of farmer associations in participatory district planning, as well as in demand-driven multi-stakeholder services provision, coordinated and managed at district level.

Two main pillars for the organization of agricultural extension in Mozambique have been the National Extension System (SISNE), in which different extension providers from public and private sector have a role and the Unified Extension System (SUE) of the Ministry of Agriculture in which all agricultural services operate through a single extension officer contacting farmers in a particular area of operation (see Table 1 and Figure 1).

In this model the public sector extension must provide services as well as coordinate, oversee and regulate private sector provision of services. This new role and the accompanying responsibilities require adequate and timely external and internal support, managerial savvy at all

¹ Of Mozambique’s 128 districts (not all of which have agricultural potential), public sector extension services operate in 48 of the 52 districts considered as a priority by National Directorate of Rural Extension. The criteria for coverage included density of population, agro-ecological characteristics, accessibility and degree of rural poverty. The other districts were not covered because of limited available resources, including financial, human and material.

administrative levels of public sector extension, tight organization and decisiveness, leadership that includes participatory involvement in decision-making, individual dedication and programmatic vision.

The public sector therefore must 1) provide agricultural services and 2) coordinate planning and monitor and evaluate the NGO and private parts of SISNE. I first examine the role of providing agricultural services (see Figure 2). The public extension service has offices at the national, provincial, and district levels. The district extension is composed of three teams, each composed of eight extension officers and one director. An extension officer live in different communities and works with 10-16 groups of 15-20 smallholders, amounting to roughly 200-250 households directly contacted, (ii) the extension officer visits and trains these groups twice a month, following a rather linear transfer of technology approach. These district agents sometimes have a technical problem or lack of expertise in which they will call on an agent from SUE (Unified Extension Service), composed of specialists based at the different levels, that assist both NGO's and the provincial and district extension services. Furthermore if there are particular problems IIAM (Mozambique Institute of Agricultural Investigation) investigates any problems identified by the public extension service and SUE.

Table 1. The Mozambique Extension System

1. Integrated National Extension System (SISNE)	Public extension NGO Private
2. Provincial extension services (SPERs). District Extension Service	3 teams (8 technicians) 1 (director) Spend 15 days in the field with regular formation
3. Unified extension system. (SUE) with SISNE	These are the specialists that work Fishing Forestry Etc.
4. IIAM Mozambique (Mozambique Institute of Agricultural Investigation)	In charge of agricultural investigation

To clarify this relationship I will use the example of the Cassava at the district level in Meconta. In recent years, local farmers have found themselves facing a new enemy: "brown streak," a disease that destroys the cassava roots — the single most important food crop for many in the region. The public extension agents at the district level in collaboration with NGOs, IIAM, and SUE conducted field trials in collaboration with IIAM. The trials were with stock of cassava cuttings resistant to the disease. After the resistant varieties were selected stock was distributed to farmers on the condition that they pass on some of their next crop to other farmers in need.

Integrated National Extension System (SISNE)

Public extension

NGO

Private

Provincial extension services (SPERs).

District Extension Service

Farmer

Unified extension system. (SUE)

IIAM Mozambique
(Mozambique Institute of Agricultural Investigation)

National

Provincial

District

Community

Figure 1.
Illustration of Agricultural Extension System

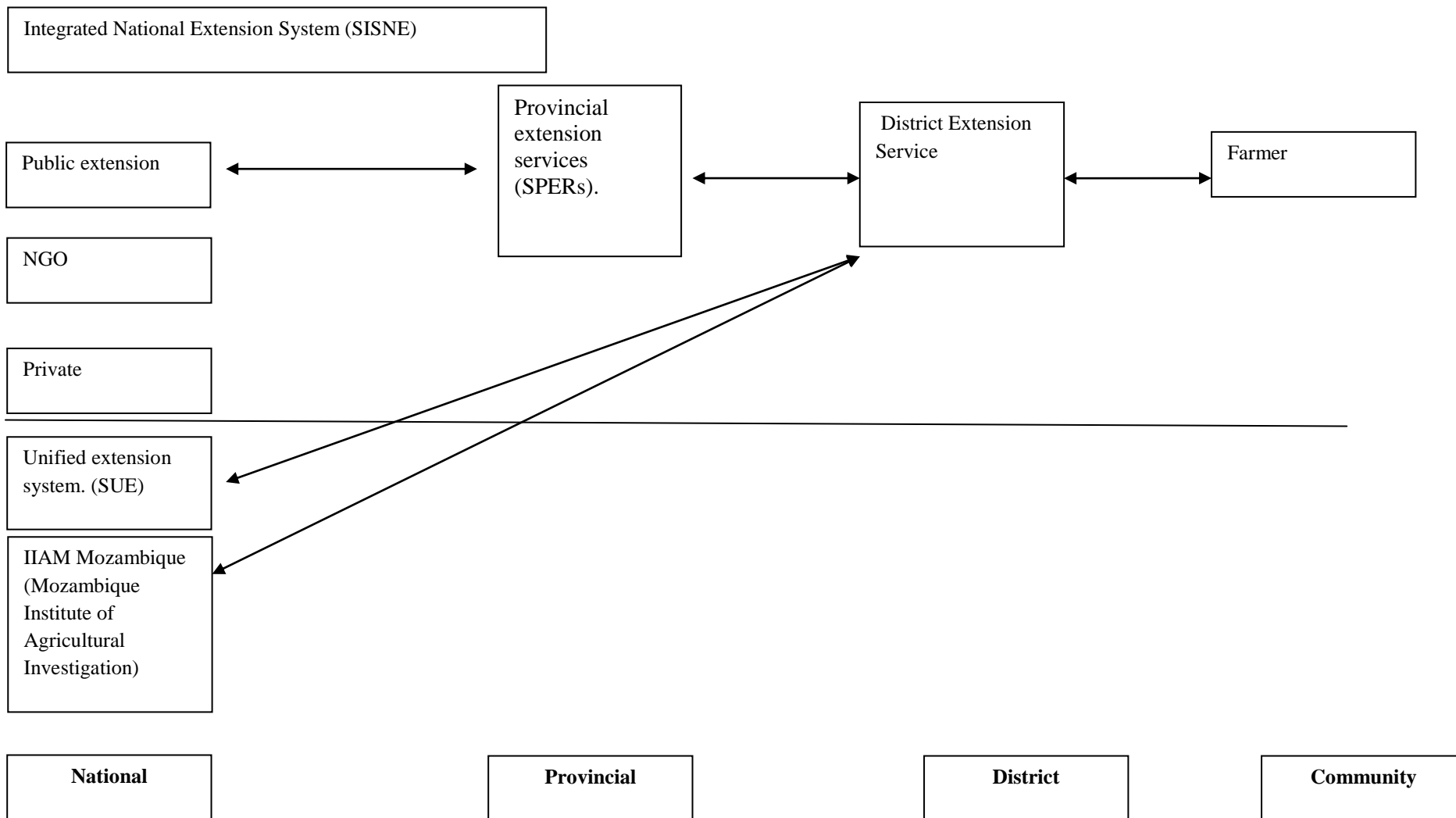


Figure 2.
Public Extension Delivery in Coordination with IIAM and
SUE

In this case there was collaboration between the public, NGO's, and the investigation service at both the provincial and district levels. It also involved communication from farmers to the investigation through the extension service. Figure two shows the manner in which this collaboration should work with communication in both direction from the national to community levels. This represents an example of the manner in which the model may work.

Different formal mechanisms exist for the coordination between research, and different extension providers, farmers and other local stakeholders on the demand for and availability of technology. The Periodic Technology Review meetings (REPETEs) meet at least once a year at Provincial level, and sometimes District level to analyze best practices in technology supply based on demand. Increasingly provinces decide to contact and contract directly some research support from zonal centers for provincial extension programs. A practice which was pioneered by a variety of NGOs, such as OLIPA and CARE, contracting research services for the enhancement of the production of new cash crops in Nampula.

The traditional approach in extension is to demonstrate improved technologies to farmers on farmers' fields. Public and private sector extension have been establishing demonstrations with farmers on crops, livestock and natural resource management in all areas of operation. Research staff is expected to provide the necessary technical back-up to this program, but have inadequate capacity to do so.

Agricultural technologies agreed upon by the various committees are disseminated through on-farm crop demonstrations, jointly managed by extension and farmers and on-farm trials managed in collaboration with IIAM.

The second role of the public sector is to regulate the deconcentrated SISNE system at the district levels (see Figure 3). Here the public sector should gather both NGOs, private providers, community extension management committees and both plan activities and later monitor and evaluate them. Theoretically the NGOs and private providers will be accountable to local communities and use innovative approaches that are participatory (farmer field schools and farmer-to-farmer extension).

In summary, the Training and Visit Approach, T&V, to extension was introduced in 1988 with the Unified Extension System was introduced, which combined frontline workers in different agricultural sub-sectors including crops, livestock and natural resource management into one system. With the move to a pluralist agricultural extension system and the deconcentration of public service delivery to the District level, an alternative and also more holistic and participatory approach to extension developed. The newly developing paradigm emphasizes this need for bottom-up approaches, public-private partnerships in extension and deconcentration of services provision, this in combination with the emphasis placed on demand-driven services provision, downward accountability, community extension management committees, learning and discovery-based extension approaches such as farmer field schools and farmer-to-farmer extension approaches, strengthens the calls for a complete, but gradual withdrawal from the traditional T&V approach.

The second goal is to examine the problems and challenges that confront Mozambique's extension model. The main observations of reviews on agricultural extension (MADER, 2002, Eicher, 2002, DANIDA, 2002, Finney, 2003, Walker et al. 2004) can be summarized as follows:

1. although the unification of public extension increased the understanding of cross-cutting issues, there are still insufficient numbers of knowledgeable, trained extension workers and as a consequence extension has been unable to systematize recommendations to the producers;
2. although the top-down Training and Visit (T&V) approach to extension is on its way out few extension officers have the needed technological, market and agribusiness knowledge and technical skills, as well as the right attitude of a group facilitator;
3. limited attributable impact of extension in reduction of rural poverty, also due to poor monitoring system;
4. there is a lack of cost-benefit studies of present and new profitable technologies for smallholders also due to a weak relation with research, both institutionally as well as technologically; and,
5. high turnover of personnel, due to the HIV/AIDS pandemic, but mainly due to poor incentives, since most extension workers are on contract; they have also no education benefits and consequently the most qualified leave for NGOs, with double pay, once they have gained experience.

The director of extension district emphasized the lack collaboration between public and private (non-profit and for-profit) extension entities. In general, private extension organizations – particularly international NGOs – are more accountable to the agency headquarters that provide their financial support. However, public sector extension had (and still has) some notable partnerships with international NGOs.

The absence of a public extension system in most parts of the country and given the specific extension history, private and NGO extension service deliverers filled the gap to some extent, particularly since 1992. The pluralistic delivery of extension services was formally recognized in 1998 in the then approved extension master plan. It was anticipated that the pluralistic delivery of extension services will advance to attain greater cost effectiveness and enhance farmer responsiveness compared with the situation where public sector extension is the sole provider. District Agricultural Development Plans, however, are often of poor quality or non-existent and do not contemplate the often complementary role of different extension service providers, based on comparative advantages and principles of cost-effectiveness and sustainability.

Many national and international NGOs are operating in agricultural extension. The main contributions to the national extension system are: (i) increased geographic coverage and number of farmers reached; (ii) promotion participatory learning approaches; (iii) formation of farmer and community groups; (iv) promotion of best practices (food security, farmer organizations, market support and agricultural advocacy); and (v) combating HIV/AIDS. Some negative NGO lessons are the notion that some place more attention on community participation as the ultimate goal rather than a means to agricultural development (Gemo et al 2004, pp 38-39).

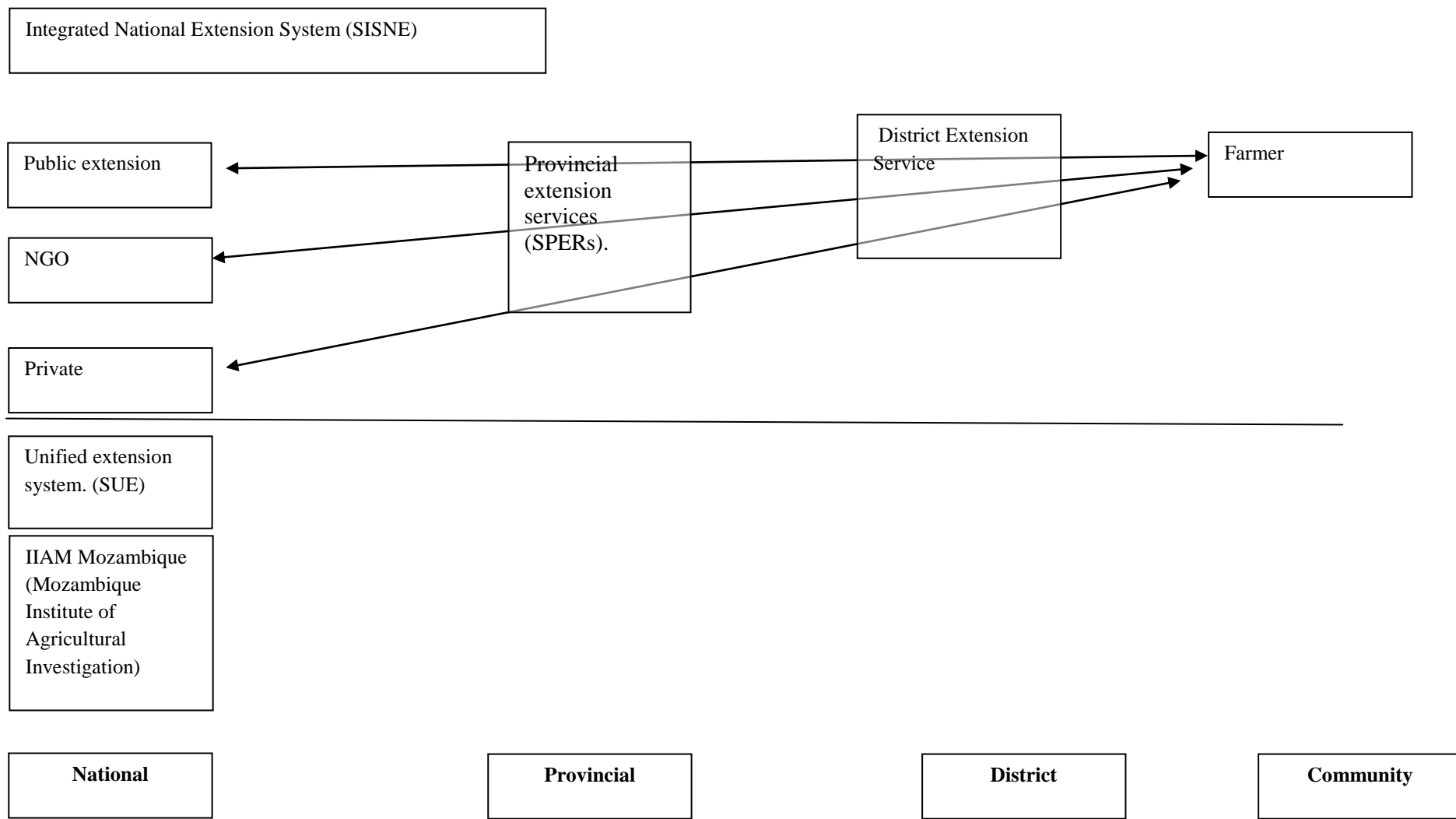


Figure 3.
Public Extension Delivery in Coordination with NGOs and
Private Providers

In Meconta, Moma, and Agoche there was interaction between the NGO's and public extension. The strength of the relationship varied from place to place. In one of the three there was strong interaction including trimester planning. In others the state played the role of regulator but still helped to coordinate activities.

In general the public sector praised the impact of the NGO's. They reinforced the lack of ability of the public sector to meet many parts of the districts. The main complaint from the state agencies was about the lack of accountability. In two of the three districts there was a lack of reports coming back from the NGO's from the public sector.

The degree of collaboration and coordination of activities varies from province to province. Most of NGOs and private for profit organizations in the provinces attend the annual technology review meetings (REPETEs) and budget preparations organized by the provincial extension services (SPERs). However, much remains to be done to increase the connectivity between public, private and NGO extension in Mozambique.

Furthermore in some districts there is a duplication of services. A lack of joint planning leads to NGO's working in the same community and duplicating services. This reflects both the public sectors inability to coordinate as well as the lack of accountability on the part of NGO's. In a nation with the needs of Mozambique this is limiting the impact of much needed investment.

The main problem in the current system is the lack of impact of the public sector. The public extension lacks fuel, money, and transportation. Many of the extension agents have to ride bikes to reach some of the communities. This is particularly concerning because as was shown in Figure two the public sector is the main linkage of information from investigation to the farm. This lack of linkage creates problems in terms of any linkage of the diffusion back and forth between investigation and extension.

Problems with research and the separation of the Unified Extension System were also themes mentioned as problems. Currently there are yearly meetings to decide which technology to disseminate. Having such a separation between public extension and research is problematic because research may not respond to the needs of extension agents or farmers. Research must be brought to a level in which it is much closer to both extension and farmers. Furthermore the Unified Extension Service being separated from the public extension takes away important resources needed by the public extension service.

The weak state and limited resources also create very strong holes in many of the districts. NGO's do not cover the entire district and there is a need for more extension coverage. An example is the case brown streak in cassava. In all three of the districts there are problems with brown streak which threaten the population in terms of food security as well as eating varieties that are toxic with health impacts.

There has been research but not at a regional level. This means that many people are being left out of what may be considered a very serious social problem. Extension should be conducting

trial at a much larger scale to both test varieties in different ecological zones, to help propagate stock, as well as to involve farmers in the process for social acceptance. This, however, is not happening.

Conclusion

Agricultural extension for smallholders in Mozambique faces some enormous challenges in reaching the poor, some of these are: (i) largely socio-economic, ecological and hence farming system diversity combined with relatively low population density; (ii) complexity of farming systems and the availability of new profitable technologies; (iii) low effective demand for extension due to, amongst others, level of education of farmers and the level of market-orientation. Based on these challenges the extension system is de on the basis of three main principles; (i) deconcentration of the services to district level; (ii) enhanced participation of the target group in services provision; and, (iii) partnership with other actors, also through outsourcing.

Mozambique moved towards the development of a pluralistic national system of rural extension. The Government's PROAGRI agricultural policy framework resulted in a National Extension Master Plan that calls for the advancement of an Integrated National Extension System (SISNE). SISNE envisaged an institutionally diversified system of extension, utilizing both public sector and private sector extension providers to disseminate agricultural information to farmers. There are numerous uncertainties that confront Mozambique's public sector extension service in developing a pluralistic extension system.

The consensus of the reviews (MADER, 2002, Eicher, 2002, DANIDA, 2002, Finney, 2003, Walker et al. 2004 is that the actual model of Training & Visit. Today's understanding of extension goes beyond technology transfer to facilitation; beyond training to learning, and includes assisting farmer groups to form, dealing with marketing issues, and partnering with a broad range of service providers and other agencies. Thus many people are now using the phrase, "agricultural advisory services," instead of extension (which can imply a top-down approach and may ignore multiple sources of knowledge

Strengthening the collaboration between farmers, research, extension and institutions of higher learning in the generation and the dissemination of appropriate technologies is a fundamental issue that needs to be taken into consideration in the implementation of research and development that will address the needs of farmers.

Unfortunately, there is no "best practice" for modifying extension programs, a magic model that can be standardized and implemented anywhere. This had been tried with Integrated Rural Development Programs, training and visit extension, and to a certain extent, farmer field schools. However, there are many good models with useful features that, when implemented in a flexible, participatory, and sustainable ("smart") way that meets the unique frame conditions of different countries and farming systems, can lead to improved extension performance and positive impact that policymakers are looking for in Sub-Saharan Africa. Promising models include the farmer field school approach; the Indian ATMA market-driven approach; and pluralistic, demand-driven

models that incorporate the use of information and communication technologies. Many judge it as a successful model of extension reform (Anderson, 2007).

Whatever model is adopted there needs to be a strong evaluation of the relationship between NGO's, the Public Sector, and investigation. The weak linkage and lack of ability of the state are of particular concern. There needs to be a stronger public sector and better linkages with the farmer being the center of the process, rather than, the last in a system with weak linkages.